BROOKHAVEN NATIONAL LABORATORY PHYSICS DEPARTMENT	**Number:** PO-ESH-06	**Revision:** 1.3
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Subject: Radiological Control – ALARA Program		
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RADIOLOGICAL CONTROL

ALARA PROGRAM

This Policy is to be implemented in conjunction with the Laboratory Radiological Control (BNL-RCM) Manual. ALARA (As Low As Reasonably Achievable) is an operating principle for radiation protection by which personnel and environmental radiation exposures are limited to the lowest levels commensurate with sound economic and social considerations.

In the Physics Department, the most common sources of exposure to ionizing radiation of concern to the ALARA program will arise from the use of non-dispersible radionuclides and from laboratory-scale radiation generating equipment, such as X-ray machines.

This policy includes the elements of the ALARA Program, Administrative Control Levels (ACLs), and the Collective Dose Limits as given below.

I. ELEMENTS OF THE ALARA PROGRAM

A. Scope

The ALARA program of the Physics Department consists of the BNL Radiological Control Manual (BNL-RCM), and Department Policies. The goal of the Physics Department ALARA Program is to increase staff awareness of the importance of applying ALARA principles to their work, with the intention that this increased awareness will lead to safer conditions and lower radiation exposures.

B. Management

Physics Department management is committed to maintaining exposure to ionizing radiation as low as reasonably achievable. The Department Chair has appointed the ES&H Coordinator as the ALARA Coordinator for the Physics Department.

C. Responsibility

Occupational workers shall know about and apply reasonable exposure reducing techniques in the planning stages, as part of Work Planning and Control for Experiments and Operations.

Supervisory personnel shall fully support the implementation of ALARA and work to ensure that the workers under their supervision comply with and apply the principles of ALARA in their work assignments. Supervisors must ensure that workers receive appropriate training and that the workers are aware of current ALARA guidelines. They shall ensure that adequate equipment and facilities are available for employees to perform the work safely in accordance with ALARA principles.

The Physics Department is a low hazard radiological facility and is not required to have a formal ALARA Committee. Radiological work is reviewed, and ALARA principals applied, as part of the Experimental Safety Review, or as part of Work Planning.

The ALARA Coordinator is responsible for implementing this program.

D. **Administrative Review**

The ALARA program will be assessed/audited as required in the RCD ALARA program description.

E. **Job Planning/Review**

Written procedures, such as Radiation Work Permits or Work Control Permits may be required for certain levels of radiological work, as determined by Experiment Safety Reviews or Work Planning.

F. **Training**

ALARA training is part of the facility specific training and is required of all employees, guests and visitors and shall be maintained as required in the RCD ALARA program description.

II. INDIVIDUAL RADIATION DOSE

A. The Physics Department establishes an ACL of 100 mrem per calendar year for those trained individuals who work exclusively in the Physics Department and non-research facilities and an ACL of 250 mrem per calendar year for those individuals who work at other research facilities. The individuals covered by these ACLs are those who are members, work in, are a guest, or visitor of the Physics Department and whose ES&H Personnel Monitoring is charged to a Physics Department account. Training requirements are those set by the Laboratory's Radiological Control Division.

B. These ACLs can be extended to 1,250 mrem per calendar year with permission of the Department Chair ***prior to*** an individual exceeding the Department's ACLs.

C. These ACLs will be evaluated annually by the Department Environmental Safety and Health Committee, ALARA Coordinator and the Department Chair.

D. For those without training, (i.e. members of the public, employees, guests, visitors, and minors), and all trained minors (including minor students), an administrative control level of 25 mrem per year is established. To increase this level to 100 mrem per year requires approval by the Department Chair and the Radiological Control Division Manager ***prior to*** exceeding the 25 mrem limit. Minors, those under the age of 18, shall not work in Controlled or Radiological Areas without written permission.

E. ***Prior to*** any individual exceeding the Laboratory Administrative Control Level of 1250 mrem per calendar year, approvals of the Laboratory Director and the Radiological Control Division Head shall be obtained.

F. ***Prior to*** exceeding the 2000 mrem/year DOE Administrative Level an individual must have approval from the DOE Secretarial Office or designee.

G. All individuals receiving a dose extension authorization shall be informed of the potential risk of additional dose by qualified Radiological Control Division personnel.

H. Reporting

1. ES&H Services Personnel Monitoring shall be notified of any dose extension authorization. The Radiological Control Division shall be sent a copy of all approvals for minors to enter radiation areas and to exceed 25 mrem dose. **Typical forms for ACL extension are included as Attachments.**

2. Total effective dose equivalent (TEDE) received from external and internal sources shall be used for the administrative dose control Levels.

SUMMARY OF PHYSICS DEPARTMENT ADMINISTRATIVE LEVELS

Period of Interest	Maximum Individual Dose Level, mrem	Individual Dose Level With Line Authority Approvals, mrem
Calendar Year	25 Those without training, -i.e. members of the public, employees, guests, visitors	up to 100 (Chair Approval)
	25 Minors including minor students - *with parental permission* (trained and untrained)	
	50 Declared pregnant workers and embryo/fetus per gestation	up to 350 (Chair Approval)
	100 Trained, working exclusively in the Physics Department	up to 1250 (Chair Approval) 1250 to 2000 (Lab Director Approval)
	250 Trained, working in other research facilities	above 2000 (DOE Secretarial Office or designee)
Day	100 Trained only - excluding minors	100 to 200 (Approval authority will be on the Radiation Work Permit)
Lifetime	N rem	Where N Is Age of Person in Years Laboratory Director Approval To Exceed N rem

III. COLLECTIVE RADIATION DOSE GOALS

A. The Collective Dose Goal for all Physics Department personnel has been set at 2 person rem for a calendar year. This is specifically for all those who have their TLD service through a Physics Department account.

B. REPORTING

1. The ES&H Coordinator shall obtain exposure data from Radiological Control Division (RCD) Personnel Monitoring in a timely manner so that progress of the collective dose can be monitored and reported to the Department's ES&H Committee at least annually. The status of the collective dose goal shall be used as a performance indicator.

2. Collective dose shall include the doses received from external and internal sources.

Official copies of these procedures are maintained at this website. Before using a printed copy, verify that it is the most current version by checking the document issue date on this website. Signed copies of these official procedures are maintained at the Training Office.